CANADA - NOVA SCOTIA

FLOOD DAMAGE REDUCTION PROGRAM

Annual Report

For Year Ending March 31, 1983

Environment Canada

Nova Scotia Department of the Environment

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INTRODUCTION

The people, communities and industries of Nova Scotia were spared the trauma, expense and work of coping with serious flooding in fiscal year 1982-83. The winter was very mild with little snow accumulation. Frequent melting spells coupled with rain dispersed snow and prevented seriously high flows from occurring in streams and rivers. Other Atlantic Provinces were not as fortunate. In New Brunswick, the Saint John River flooded as usual. In Newfoundland where, like Nova Scotia, flooding is less predictable, an unprecedented rain storm caused severe flooding and damage in Bishops Falls and other communities in central region.

Agreements between Canada and Nova Scotia, made in 1978, provide for a general program to last ten years and particular mapping and remedy studies programs to last for five years. Costs for these mapping and remedy studies are shared equally by the two partners. The Canada-Nova Scotia Flood Damage Reduction Program continued to develop planning and management tools to prevent or reduce flood damage in the province.

PROGRAM PURPOSE

Prevention of flood damage and to some extent reduction of flood damage potential are the purposes of the Canada-Nova Scotia Flood Damage Reduction Program. Because the extent of flooding can be predicted even though in Nova Scotia the timing cannot, flood risk areas can be identified and this knowledge made known to those who may be affected. Accordingly, detailed flood risk maps are being prepared to inform people about risk areas. Government agencies are also being told of the risks so they will not invest in undertakings that could be damaged by flooding. Municipal governments and planners are assisted and encouraged to avoid development on flood-prone lands.

The Program also identifies solutions to flood damage risk, necessary because substantial undertakings have already been constructed in flood risk areas. The feasibility of such solutions, however, depends upon the cost of remedial measures compared to the estimated costs of future damage.

Another objective of the Flood Damage Reduction Program is to encourage better designs of structures that are placed on a floodplain. Bridges and culverts which carry flood waters of

streams of all sizes, for example, can be simulated on computer models so that overdesigned facilities can be avoided on site. Likewise, the effect of structures, or placing of fill, can be evaluated with the models and predictions of their effects on flood levels can be made more accurately than is possible without computer modelling.

METHODS OF LIMITING DAMAGE

Several methods can be used to limit or reduce flood damage, including:

1. Avoidance of floodplain lands for vulnerable undertakings such as homes, offices, and manufacturing plants. The land can be used for recreation, forestry or agriculture, which are less susceptible to flood damage.
2. Construction of works such as dams, canals, dykes or diversions to control floods.
3. Propagation of information about flood risk, publicizing historic and predicted water levels so that effective flood-proofing can be done before floods occur.
4. Use of flood proofing techniques, such as placing buildings on columns or fill to raise them above expected flood waters or sealing buildings below flood level to keep water out.

PROGRESS IN 1982-83

Flood risk maps of the Bedford/Sackville area that is affected by the main stem of the Sackville River were completed early in the year. Copies of the report, *Hydrotechnical Study of the Sackville River*, and prints of the 17 map sheets showing the floodway and the floodway fringe were distributed to affected municipal governments and planning agencies. Copies of the report are available at the Nova Scotia Government Book Store, Hollis Street, Halifax, and maps are available from the Nova Scotia Department of Lands and Forests, Granville Street, Halifax.

The Truro area hydrotechnical study work was reviewed and it was decided to terminate the contract with the hired consultants and to carry on the study with government agencies. Nova Scotia is providing field services, surveys and water level data, and the federal government is running computer studies on hydrology and hydraulics. Although this work has progressed slowly due to other demands upon the time of regular staff, the study should be completed next year. Working flood risk maps

for this area will follow completion of the study.

The *Hydrotechnical Study of the East River, Pictou* was completed late in the year. This work by C.B.C.L. Consultants included field surveys, observations of water levels, and preparation of a computer hydraulic model of the East River. Flood lines were plotted on large-scale maps of the river from New Glasgow's George Street Bridge up to Ferrona Junction, a distance of 11.25 km. Working maps, with shaded areas showing the floodway and the floodway fringe, were made by a mapping contractor and are available from the Nova Scotia Department of Lands and Forests, Map Library, Dennis Building, Granville Street, Halifax. Copies of the technical report are available from the Nova Scotia Government Book Store, Hollis Street, Halifax. These maps will be useful to the public and to government officials, especially the Pictou District Planning Commission, in planning land use near the river.

A hydrotechnical study of flooding in the Antigonish area continued and was close to completion at the end of the fiscal year. The three streams of the area, Brierly Brook, Rights River and West River were carefully studied and flow rates for flood conditions were derived for each. The interaction of the three streams, and effects of ice break-up and jamming were also considered. MacLaren Plansearch Inc. carried on this work throughout the year under the supervision of the technical committee.

A study of Mill Brook, Kentville was started to identify the mechanics of flooding by the brook and to find solutions to the damage problems caused by flooding. Floods in the area are due to interaction of high tides, ice jams and unusually high water flows. At the end of the year, these relationships had been identified, estimates of damage risk made, and preliminary examinations of possible solutions completed by consultants, MacLaren Plansearch Inc.

During the year, presentations were made to several municipal councils to advise them of the progress of the East River and Antigonish studies. Meetings of interested citizens of Sackville were also addressed to describe the Sackville River report and maps and their potential usefulness.

Consultations with Kentville officials preceded decisions and instruction to the consultants at several stages of the remedy identification study for Mill Brook.

PROSPECTS FOR 1983-84

The two federal-provincial agreements that provide for sharing costs will expire in June, 1983. Arrangements to replace or extend these agreements will be necessary if any further work is to be done in addition to the Truro and Antigonish mapping projects and the Kentville remedy study. It is expected the hydrotechnical study of the Truro area will be completed in 1984 and the data used in choosing design criteria for bridges for highway No. 102, and Park Street crossing Salmon River. The Antigonish hydrotechnical study and flood risk maps will be completed in the 1983-84 fiscal year.

The Ministers and Kentville Town Council will receive a report on remedies to reduce flood damage from Dodge (Mill) Brook.

The General Agreement will remain in effect so that it will be possible for Canada and Nova Scotia to agree to further measures to reduce flood damage. These measures may include sharing costs of doing remedial work in Kentville, and joint funding and direction of studies to determine solutions for flood problems in Truro, Antigonish, and Sackville/Bedford. In accordance with established policy, non-structural as well as structural solutions will be examined.

Development of Little Sackville River watershed will continue. It is critical, therefore, that hydrotechnical information about flood characteristics to support land use policies and planning be obtained. Millwood subdivision will be started by the Nova Scotia Housing Commission to meet a renewed demand for residential housing in the Metropolitan area. Concurrently with this development, it will be useful to identify and implement remedial or preventive measures to reduce flood risk.

Development is expected to continue in the Truro region flood risk area. Improvement of the highway service will be made with reference to the hydrotechnical study being done there. Private and municipal development projects will use the mapping study to identify the risks involved with sites adjacent Robie Street, and in other locations in the flood risk area.

EXPENDITURES

Approximately $160,000 was spent during fiscal year 1982-83. The bulk of this amount was for consulting services. Together with expenditures of previous years, the total thus far spent is ap-

proximately $90,000 less than the $900,000 authorized by the mapping and studies agreements combined.

The following table gives a summary of expenditures to date:

CANADA-NOVA SCOTIA FLOOD DAMAGE REDUCTION PROGRAM

Project	Previous Expenses	Current Year 1982-83	Total to March 31/83
Regional Flood Frequency Analysis	82,710	—	82,710
Truro Study			
Base Maps	33,156	—	33,156
Hydrotech Maps	117,642	972	118,614
Bedford/Sackville			
Base Maps	37,739	—	37,739
Hydrotech Study	39,679	7,520	47,199
Working Maps	838	9,220	10,058
New Glasgow/Stellarton			
Base Maps	16,837	—	16,837
Hydrotech Study	37,931	15,668	53,599
Working Maps	—	5,289	5,289
Antigonish Area			
Base Maps	27,042	—	27,042
Hydrotech Study	56,110	32,624	88,734
Kentville Area			
Mill Brook Remedy Study	—	25,666	25,666
Energy Mines Resources Canada	8,750	—	8,750
Administration, Salaries, Expenses	192,201	62,986	255,187
Annual Totals	650,635	159,945	810,580

Note: 1. The Mapping and Studies Agreements, valid to June 22, 1983 authorize $900,000 total expenditures.
2. Further information about the Flood Damage Reduction Program may be obtained from the Program Manager, phone 424-5300.

This Program is sponsored and directed by:

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